

Sem-IV/EXTC/CBGS/CIS/NOV-16/28-12-1

Control system

Q.P. Code : 546200

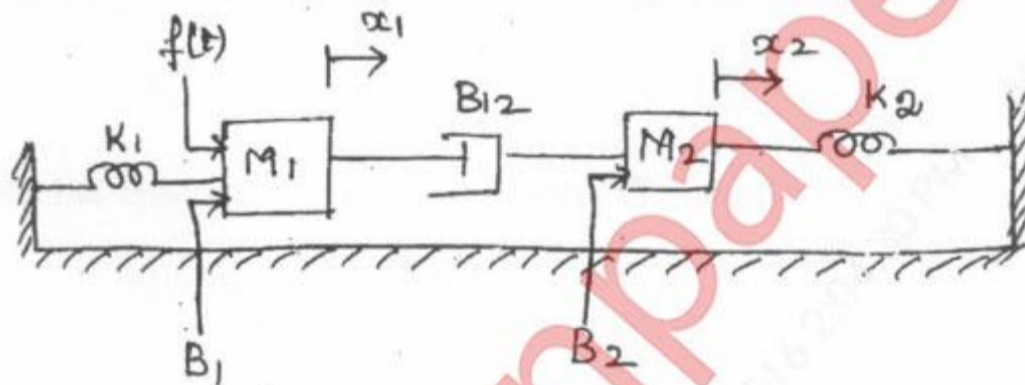
(3 Hours)



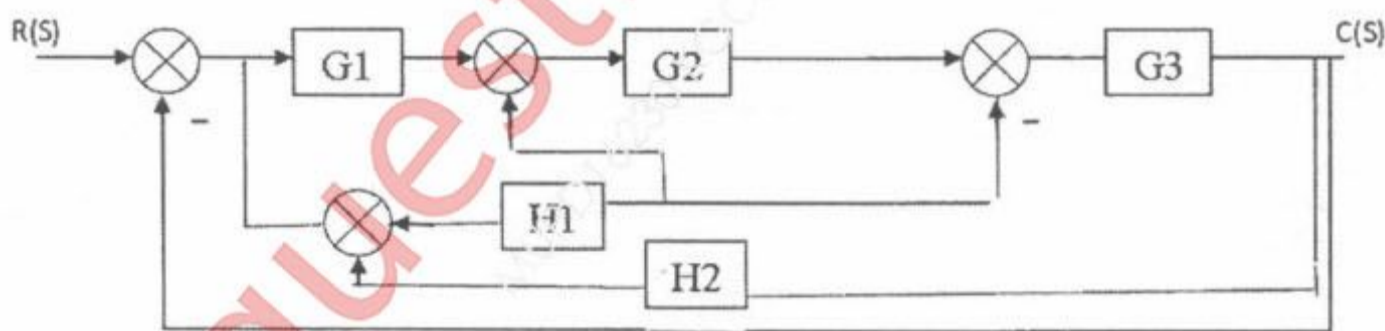
[Total Marks : 80

- N.B. : (1) Question No. 1 is compulsory.
 (2) Attempt any three questions from remaining questions.
 (3) Assume suitable data if necessary.

1. (a) Differentiate between feed back and feed forward control system. 5
- (b) What are the basic properties of signal flow graph? 5
- (c) Compare Lead compensator and Lag compensator. 5
- (d) Explain different performance index for optimal control problems. 5
2. (a) Obtain the transfer function of the Mechanical System : 10



- (b) Using the block diagram reduction Technique find the transfer function of the given system: 10



3. (a) Obtain the state variable model of the Transfer function : 10

$$\frac{Y(s)}{U(s)} = \frac{3s + 4}{s^2 + 5s + 6}$$

- (b) Explain controllability and observability analysis of LTI system. Using example. 10

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4. (a) Sketch the root locus for given system with unity feedback. 10

$$G(s) = \frac{k(s+9)}{s(s^2 + 4s + 11)}$$

- (b) Use the Routh stability criterion to Determine the range of 'k' for stability of unity feed back system whose open Loop transfer function is 10

$$G(s) = \frac{k}{s(s+1)(s+2)}$$

5. (a) Sketch the polar plot for the open loop-transfer function given by 10

$$G(s) = \frac{1}{s^2(1+s)(1+2s)}$$

- (b) Sketch the Bode plot for the following Transfer function :

$$G(s) = \frac{75(1+0.2s)}{s(s^2 + 16s + 100)}$$

6. (a) Explain the frequency domain specifications. 7
 (b) Explain the concept of Neuro-Fuzzy adaptive control system. 6
 (c) Write short note on : Steady state errors in feed back control system and their types. 7
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